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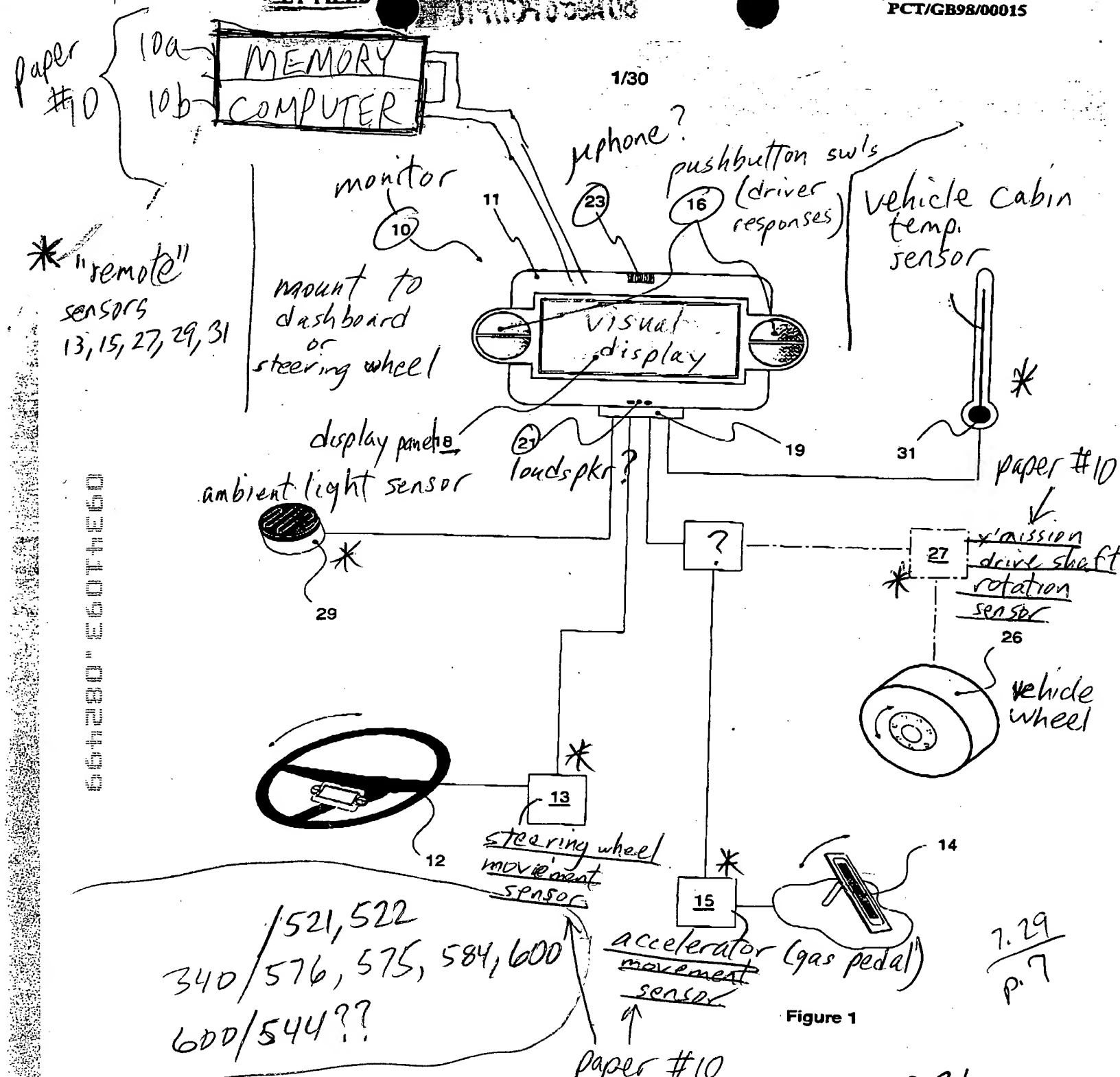


Figure 1

521, 522
340/576, 575, 584, 600
600/544??

7.29
p. 7

Descr. legends
~~Fig 1 — 13, 15, 27~~
Fig 13C — 33

2.26
6.24
6.29
Spec. headings Rule 77



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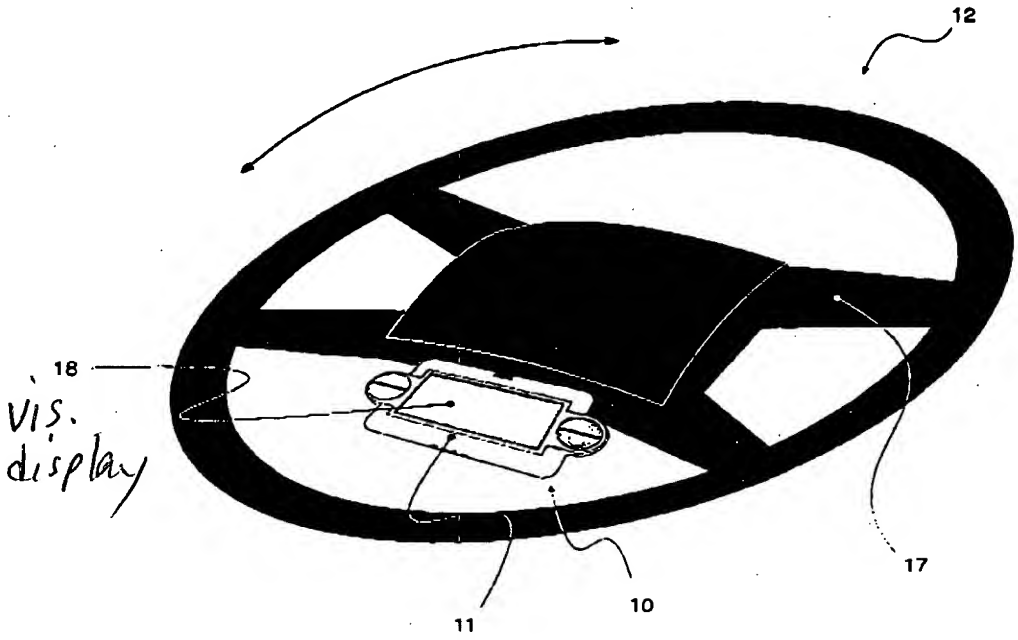


steering wheel sensor (13)

Figure 2

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LIKELIHOOD OF FALLING ASLEEP 1= unlikely, 2= possibly, 3= likely, 4= very likely, 5= certain (dead)

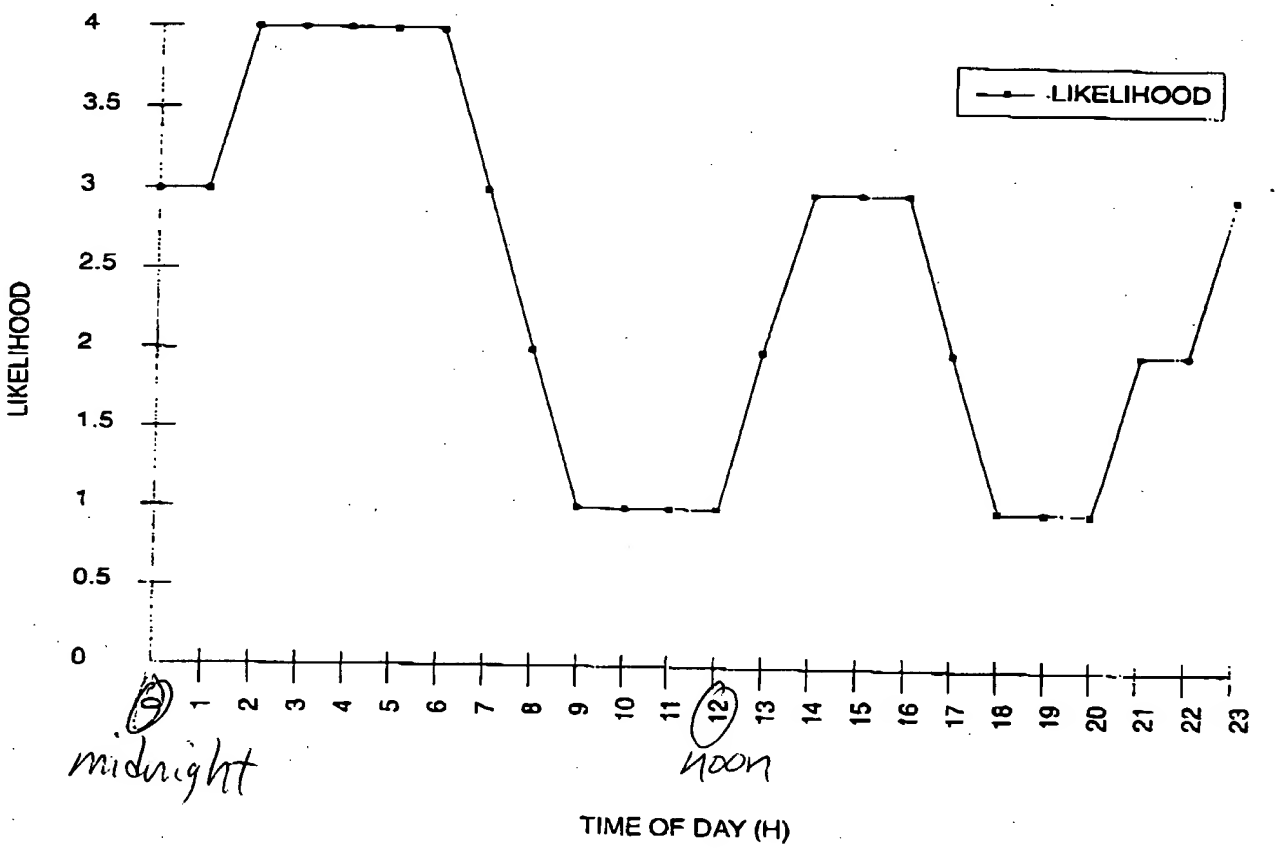


Figure 3

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Figure 4

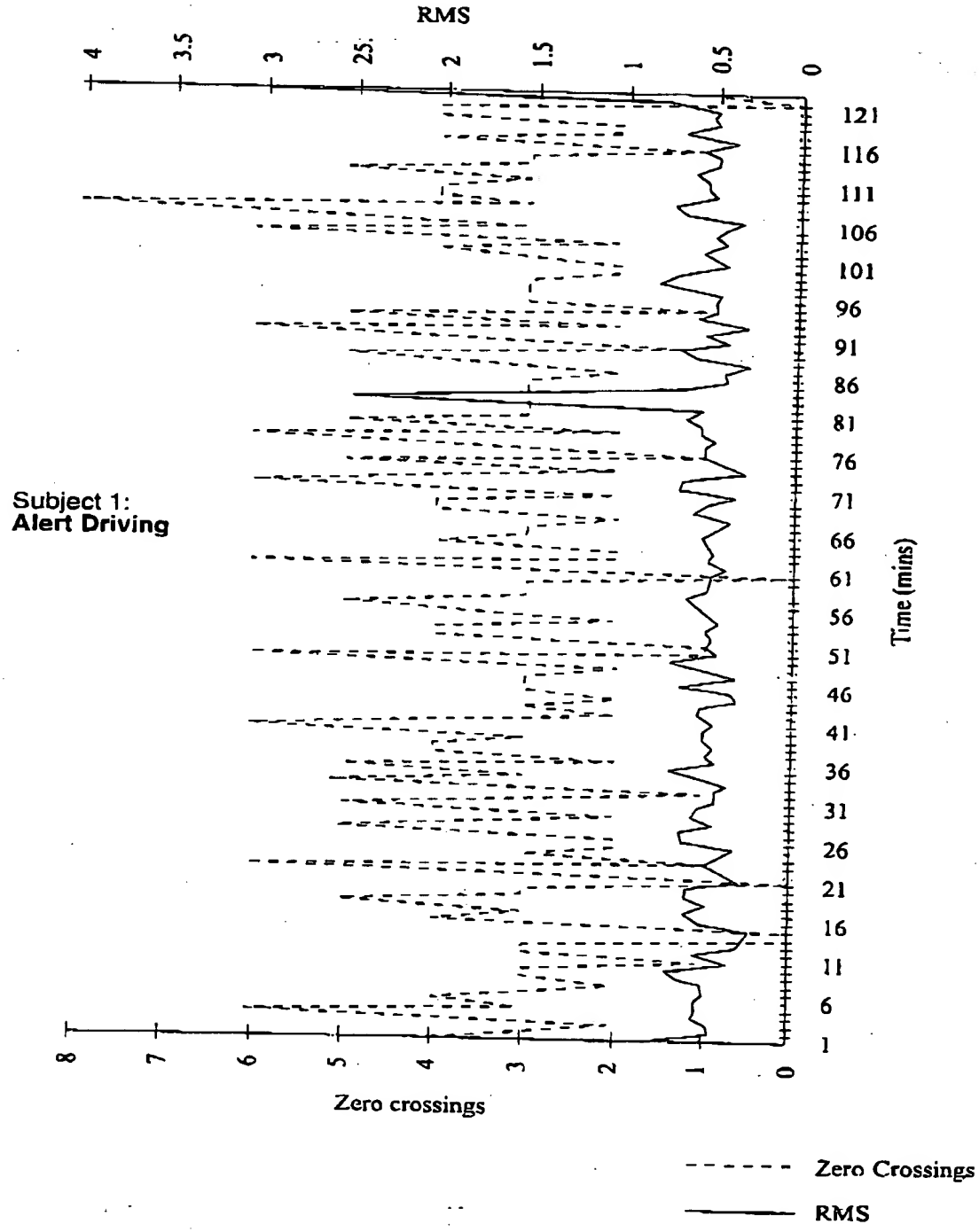

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Figure 5

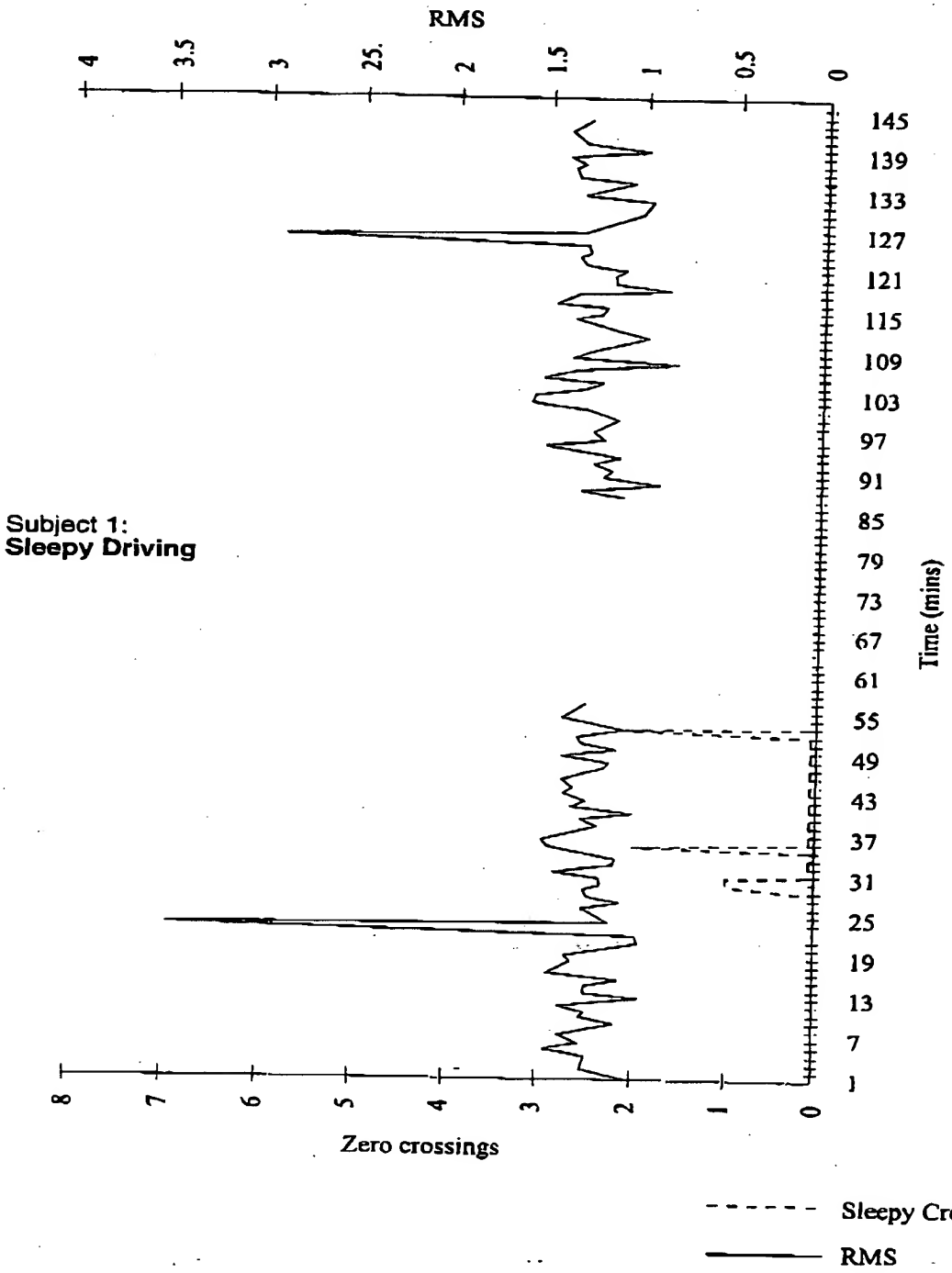

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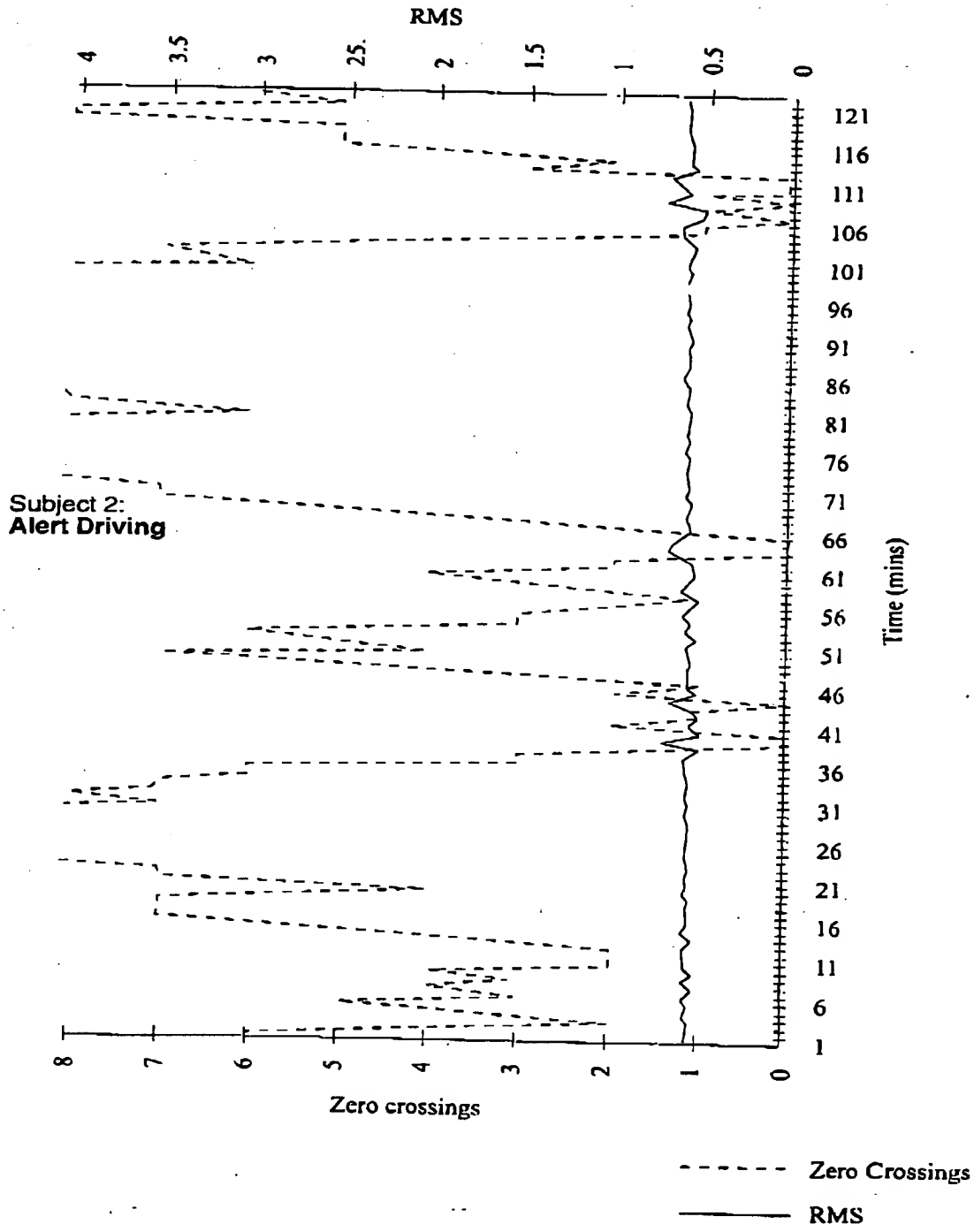
Figure 6



WINGS
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Figure 7

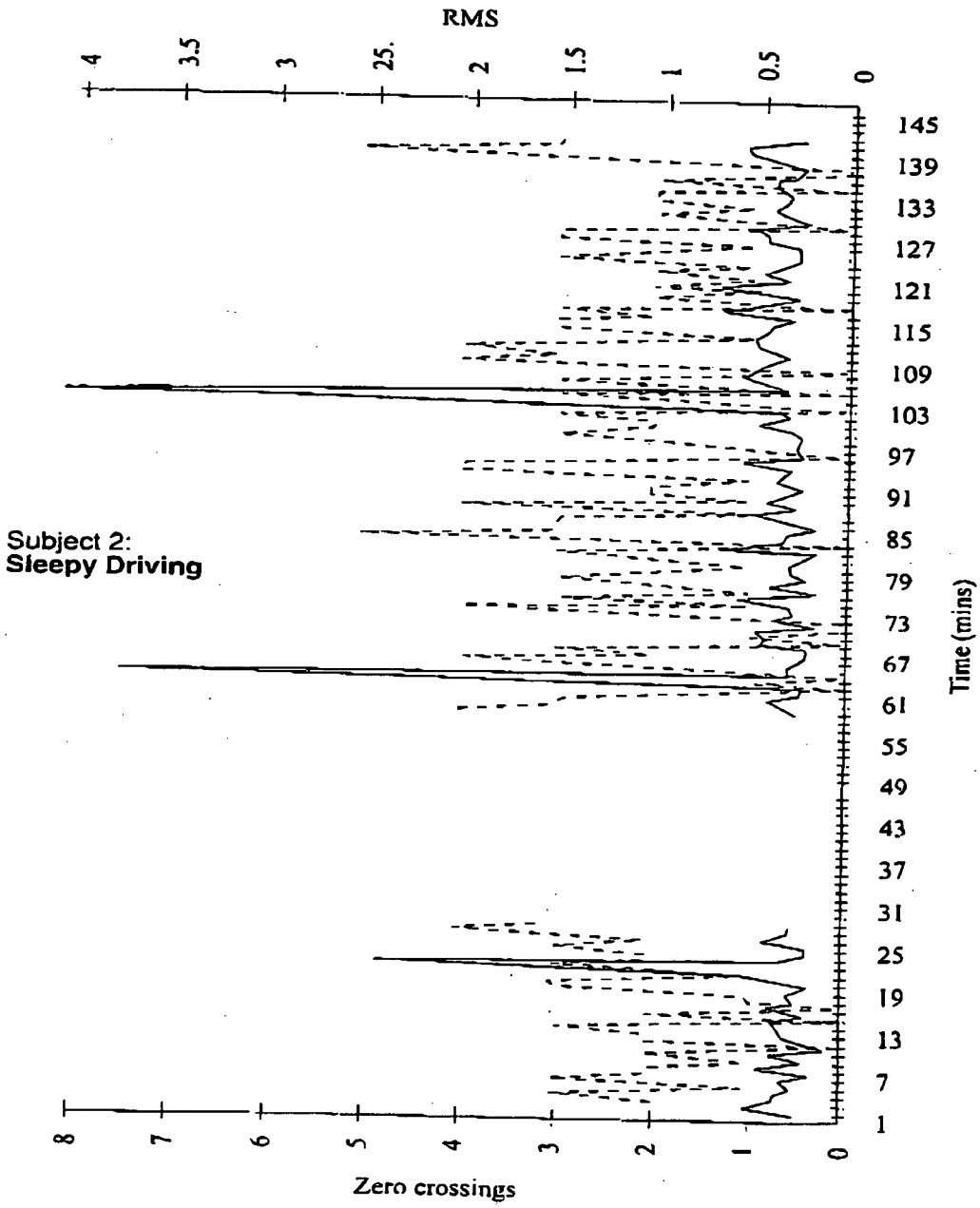

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Figure 8

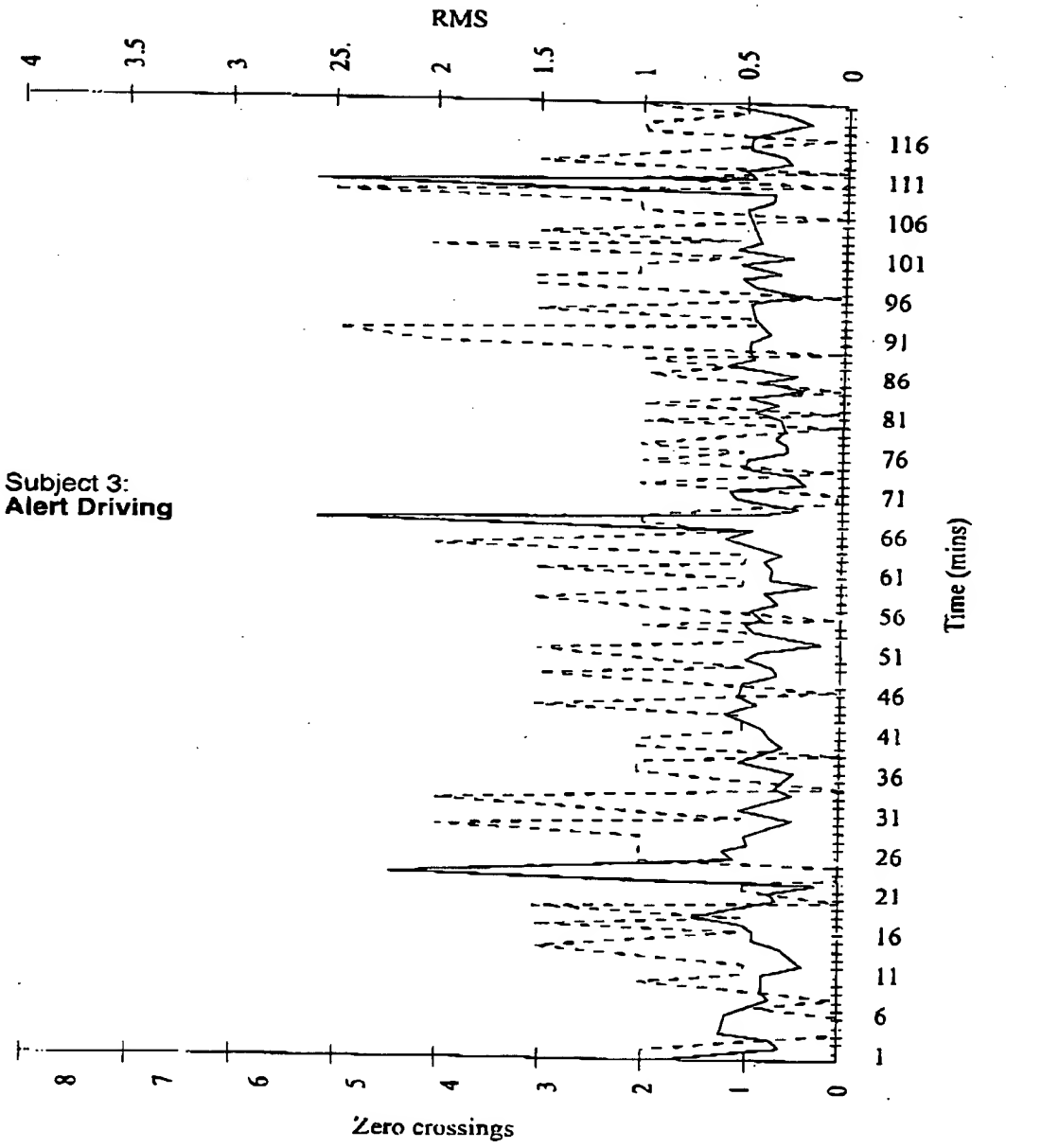

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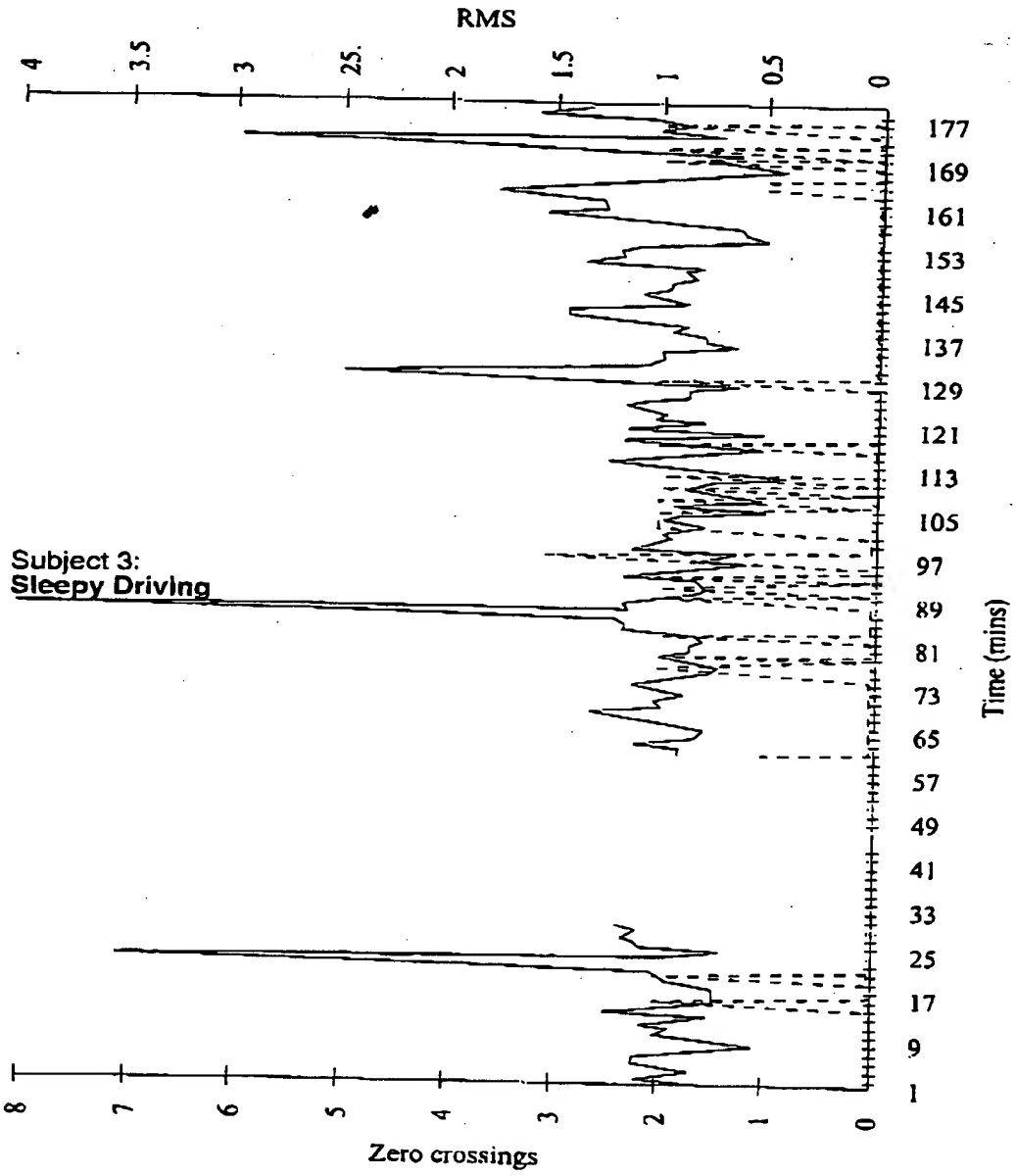
Figure 9



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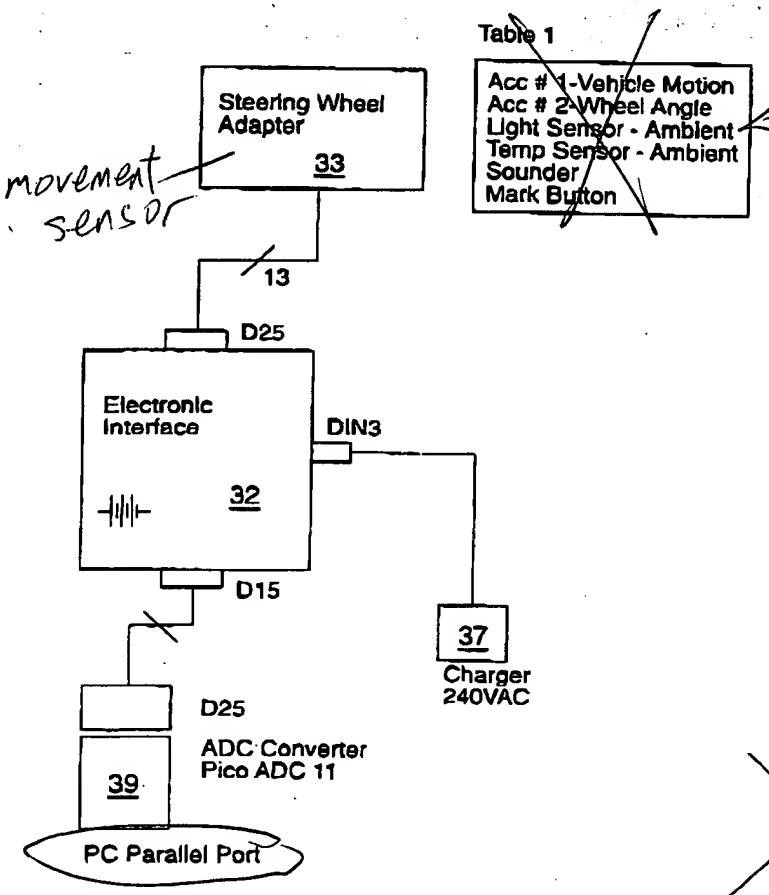


Figure 10

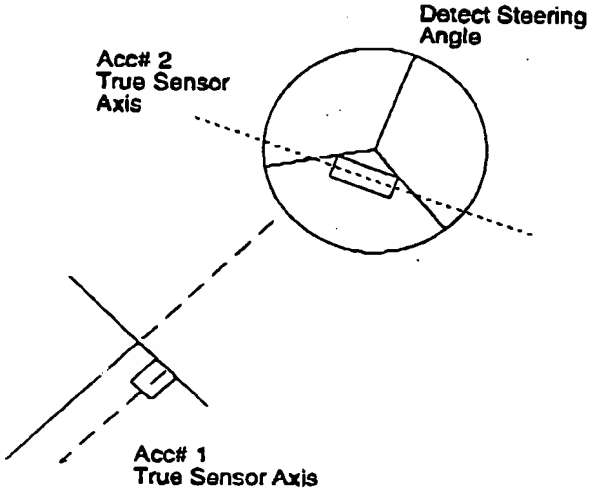


Figure 11

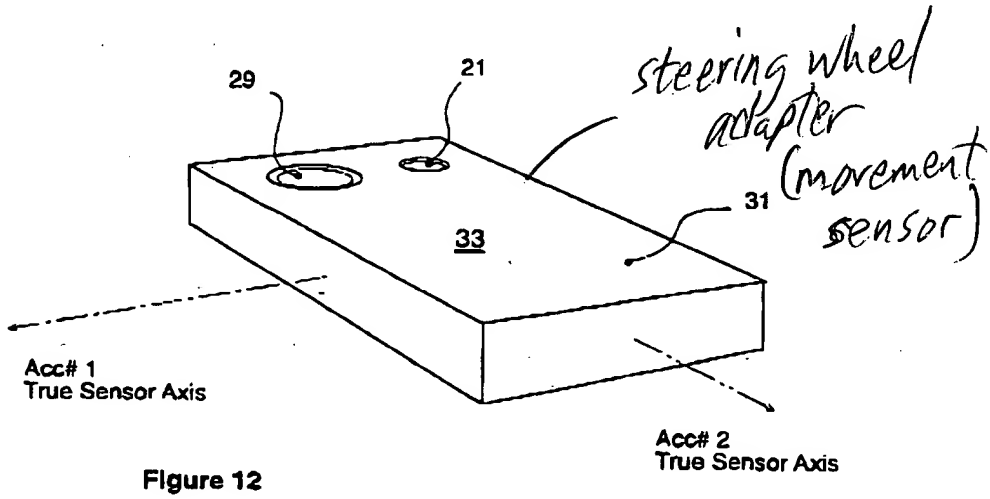


Figure 12

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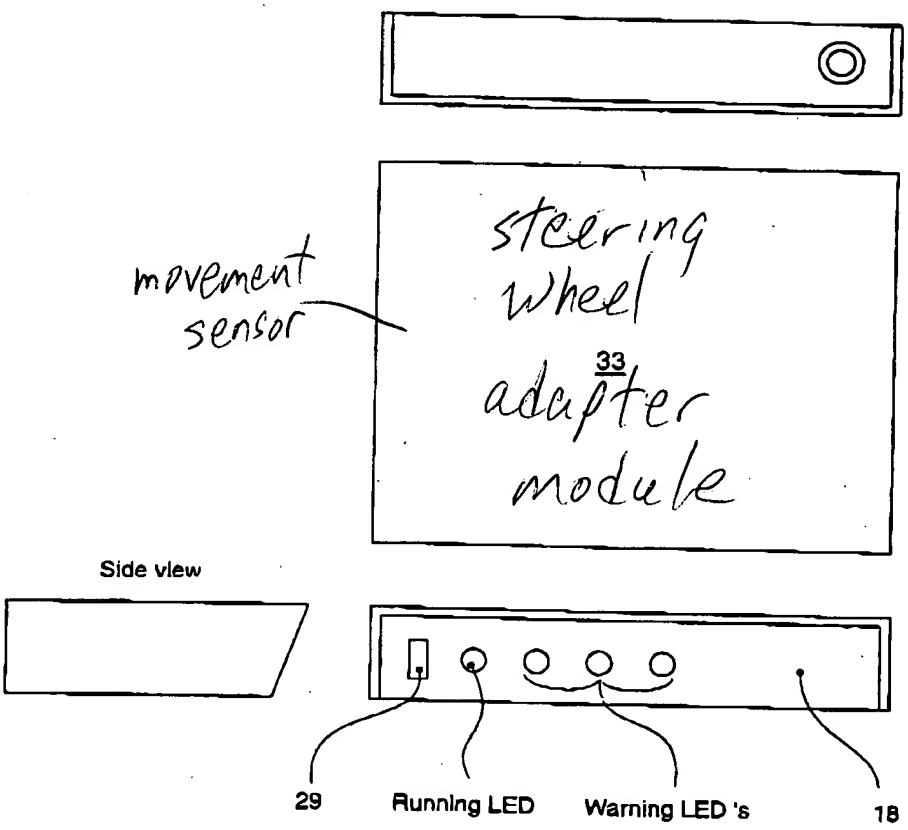
11/30




Rear panel
Figure 13D

Top View
Figure 13C

Figure 13B

Figure 13A

Steering wheel movement sensor

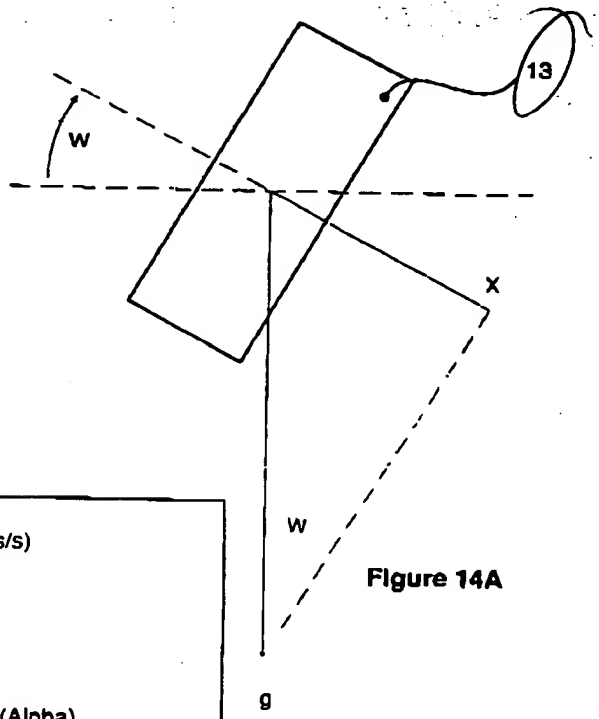



Figure 14A

Table 2

W - Wheel Rotation Angle
X - Measured component of g in sensor axis (m/s/s)
K wheel - Sensor scaling factor (mm/s/s/bit)
g - Gravity 9.81 m/s/s
g - Gravity Vector Component in wheel Plane

Sin W = X / g

X = k wheel / 1000 x (Ch(1)-ZeroWheel ) x 1/Cos(Alpha)

Sin W = k wheel / (1000 x g)x(Ch(1)-ZeroWheel)x(1/Cos(Alpha)

W + ArcSin [ Kwheel /(1000 x g)x(Ch(1)-ZeroWheel)x 1/Cos(Alpha)]

Paper #10

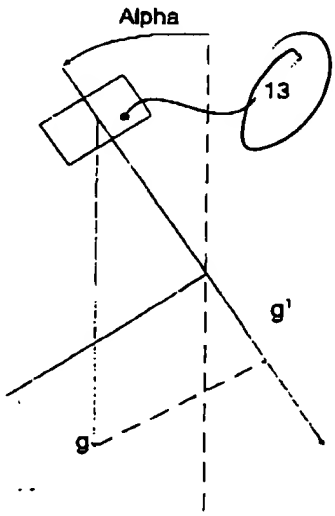



Figure 14B

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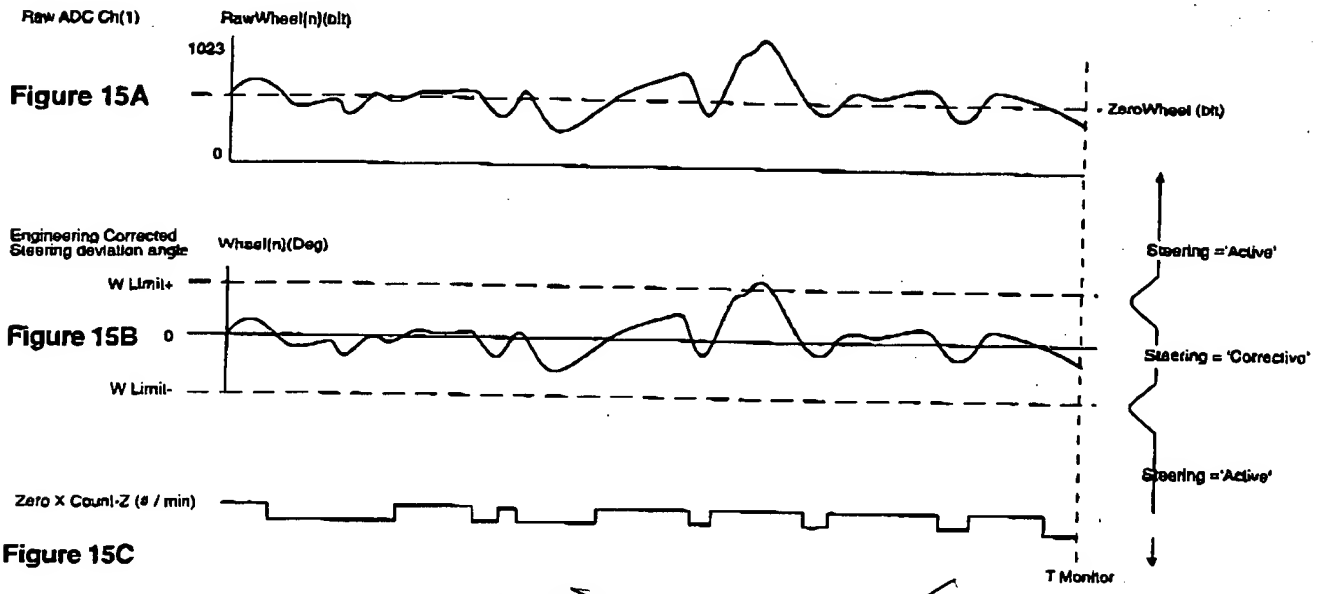


Figure 15A

Figure 15B

Figure 15C

Paper # 10

Table 3

RMS Steering Angle $R(\text{Deg}) = \sqrt{\frac{\sum \text{Wheel}[n]^2}{n}}$

Table 4

Bound Check

| | |
|---|---|
| W Limit- < W < W Limit+ | Steering Mode=Corrective |
| W < W Limit- | Steering Mode=Active |
| W > W Limit+ | Steering Mode=Active |

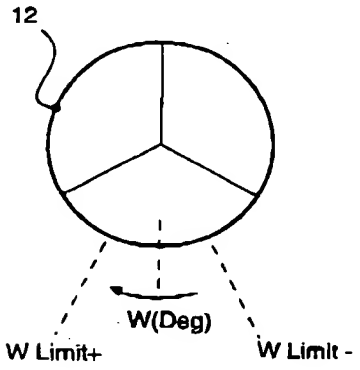


Figure 15D

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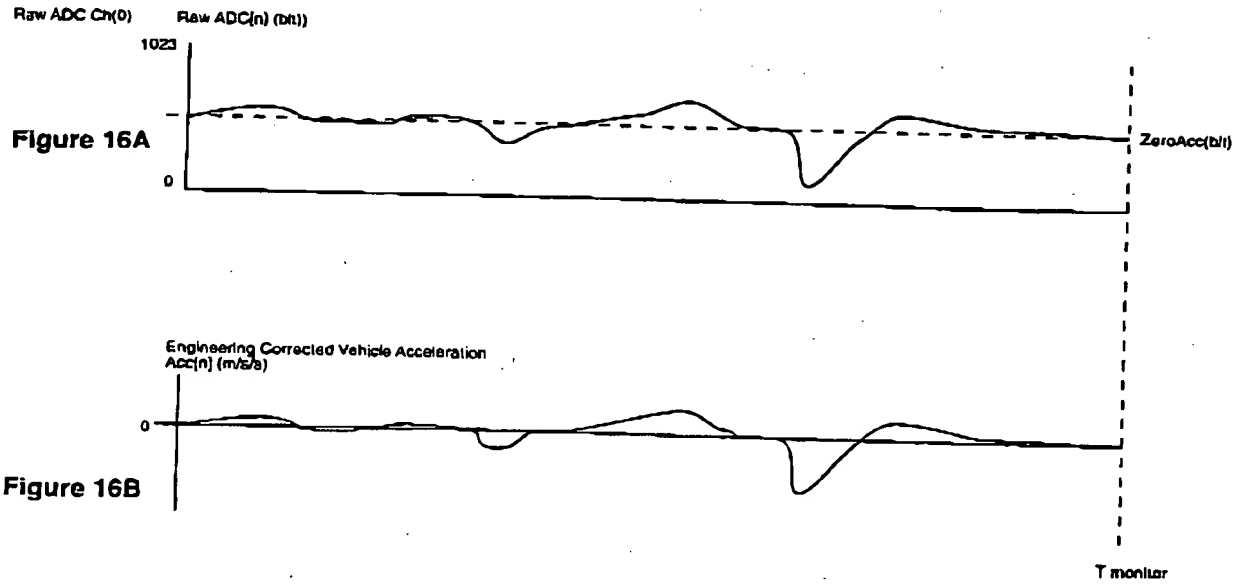


Figure 16A

Figure 16B

Table 6

RMS Vehicle Acceleration G(m/s/s) = $\sqrt{\frac{\sum Acc[n]^2}{n}}$

paper #10 →

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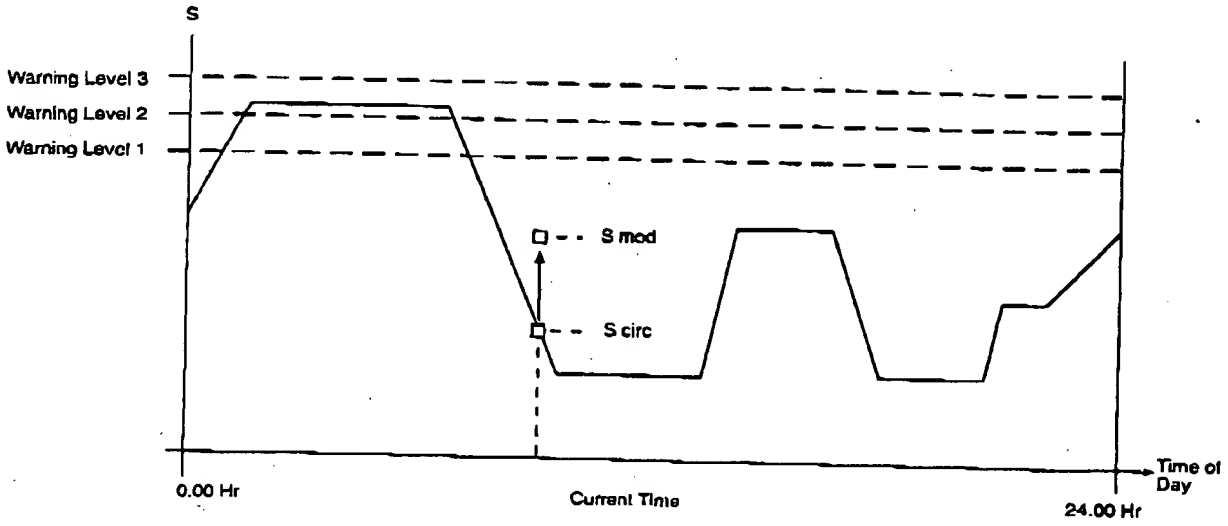


Figure 17

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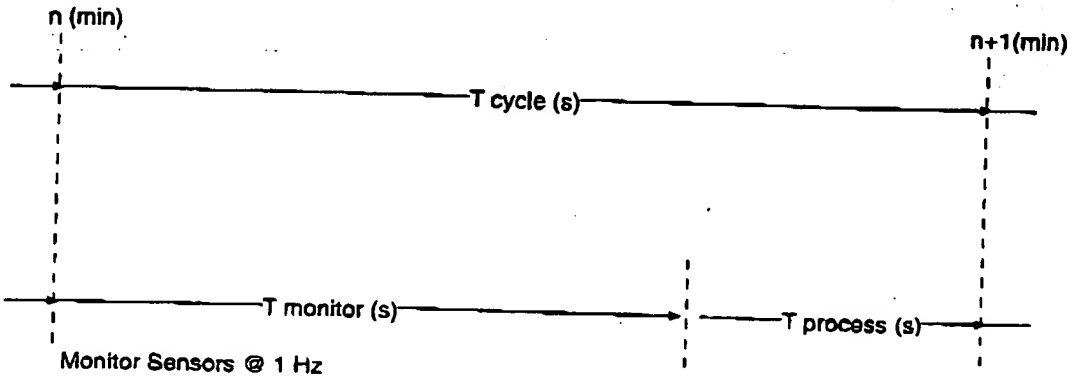


paper #10

Table 6

| | |
|---|---|
| T cycle = 60s<br>T monitor = 50s<br>T process = 10s | Calculate Parameters<br>Test & Issue Warnings<br>Update Screen Display<br>Store Sensor Data > Disk<br>Store Calculated Parameters > Disk |

Figure 18

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Figure 19

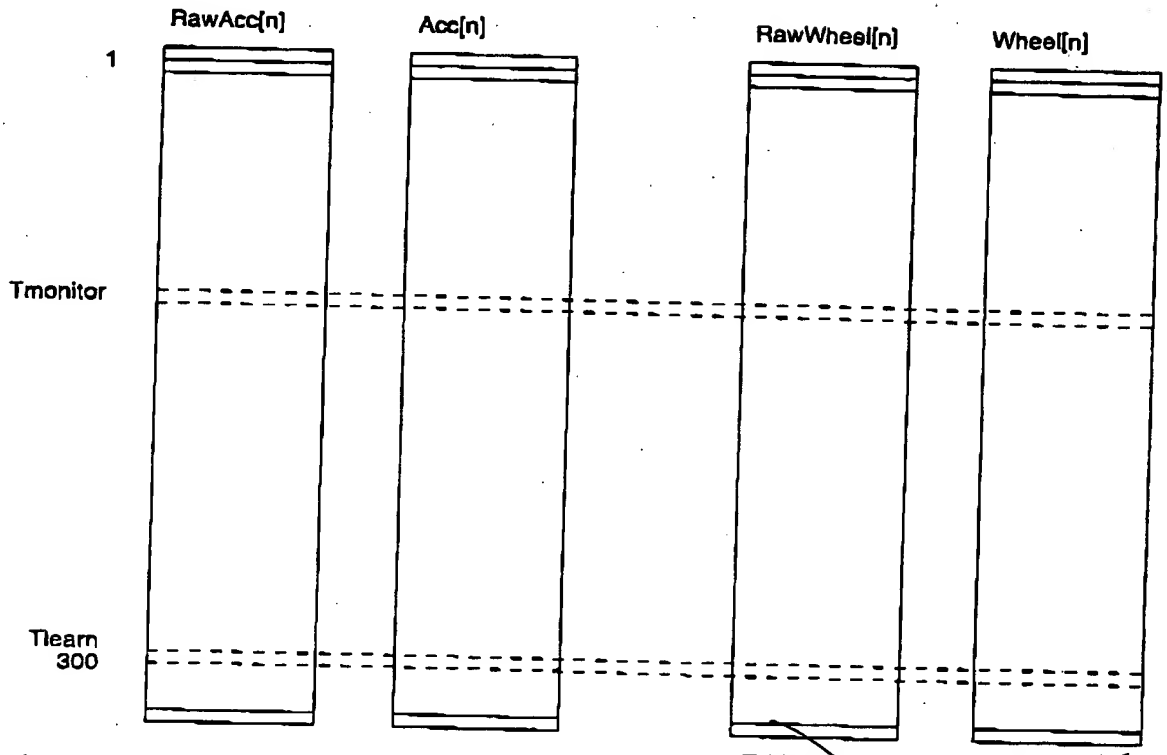


Table 7

Note:

Data storage @ 1Hz
ZeroAcc=Average {RawAcc[n]}
ZeroWheel=Average {RawWheel[n]}
Ch(N)=Raw ADC Value (bit)

Table 8

Acc[n] = Kacc/1000 x (RawAcc[n]-ZeroAcc)x1/Cos(Alpha)

(m/s/s) (mm/s/s/bit) (bit) (bit)

Wheel[n] = ArcSin [ Kwheel/(1000x9.81) x (RawWheel[n]-ZeroWheel)x1/Cos(Alpha)]

(Deg) (mm/s/s/bit) (bit) (bit)

I = Klight/1000 x (Ch(2)-ZeroLight)

(KLx) (Lx/bit) (bit) (bit)

T = Ktemp/1000 x (Ch(3) - ZeroTemp)

(DegC) (mDegC/bit) (bit) (bit)

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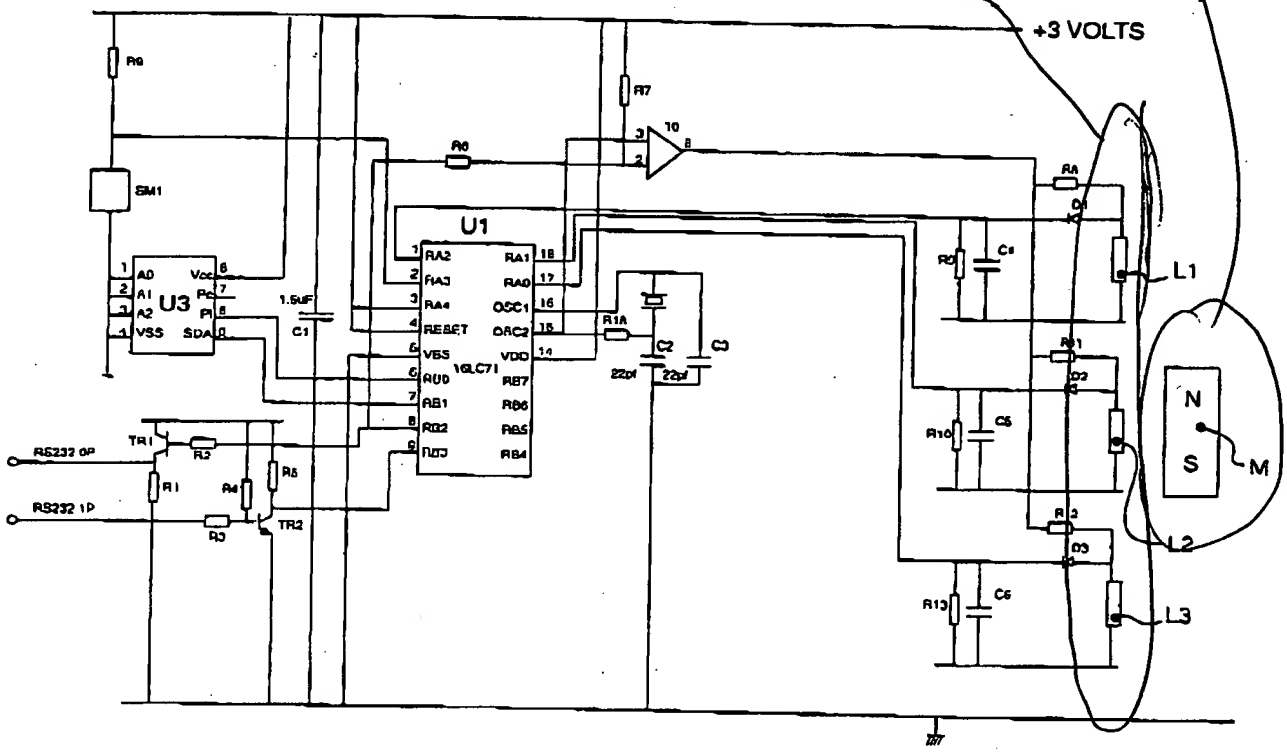
magnet mounted on steering column

3 inductors




Steering wheel movement sensor

Figure ~~21~~ 20

paper #10 →

chg. of inductance due to mag. flux coupling